

Id #: I11466      Class: EMBRYOLOGY 945      Course #: EMBRY945  
 Name: KUJAWA, CHAD W      Time:  
 Date: 5-2-1995

Test Key: BCCAEECCDBA	DBDCDAADEB	CADBADACAD	CBADBCEBEA	ADEBCBBECE
Items 1-50: 1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers: **A**D****	AE**A***B**	AC***AD*EB	E***D*****	*E*****A**

Test Key: AAABAADDCA	AABBDDDCAC	B DCAABBBEBB	DCCAAEDAAB	BEDAACBBDD
Items 51-100: 1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers: *****CA***	C**C*****	**C*DCA*DC	A*D*****	**E**D**BC

EXAM 1 Form A

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Possible Points: 96  
 Raw Score: 68  
 Objective Score: 68

CUMULATIVE

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Possible Points: 96  
 Raw Score: 68  
 Percent Correct: 70.8%

Bonused Questions = 6,48,62,96

NAME

Chad K. King

DATE

**EMBRYOLOGY MID-TERM EXAMINATION - 1995**

Match up the letters with the correct statement. The letters maybe used more than once.

**QUESTIONS 1 to 6**

- A. Endoderm of the first pharyngeal pouch
- B. Mesoderm of the first pharyngeal membrane
- C. Ectoderm of the otic placode
- D. Ectomesenchymal cells of neural crest origin
- E. Ectoderm of the first pharyngeal cleft (groove)

- 1. Fibrous stratum or middle layer of the tympanic membrane.
- 2. Organ of Corti
- 3. Endolymphatic duct and sac
- 4. Mastoid antrum off of tympanic cavity
- 5. Meatal plug of the early developing external acoustic meatus
- 6. Major portion of statoacoustic ganglion of cranial nerve VIII

**QUESTIONS 7 to 11**

- A. Ectomesenchymal cells of neural crest origin
- B. Surface ectoderm
- C. Local mesenchymal cells
- D. Neural ectodermal cells
- E. Hypoblast cells

- 7. Microglial cells C
- 8. Ventral motor root neurones D
- 9. Ectodermal placodes E
- 10. Adrenal medulla cells A
- 11. Oligodendrocytes A

Select the best answer.

12. A 3-month-old boy was taken to an ophthalmologist because the child's mother had noticed an opacity of his left eye since birth. On physical examination, a pearly nuclear cataract of the left eye was found. The defective structure was the result of abnormal development of:
- A. Ectomesodermal cells of neural crest origin.
  - B. Ectoderm of the optic placode.
  - ☒ C. ~~Neuroepithelium of the optic vesicle.~~
  - ☒ D. ~~Mesoderm of the first pharyngeal groove.~~
  - E. Abnormal drainage of aqueous humor.
13. Hyaluronic acid and thyroxine play a key role in the development and final status of the stroma of the :
- ☒ A. ~~Retina~~
  - B. Eyelid
  - C. Lens
  - D. Cornea
  - ☒ E. ~~Iris~~
14. Most recent embryology texts relate the formation of the pupillary and ciliary muscles to:
- A. Local mesenchymal cell differentiation
  - B. Surface ectoderm and mesenchyme
  - C. Ectomesenchymal cells of neural-crest origin
  - D. Cells from the neural retina
  - E. Cells from the pigment retina
15. The optic stalk is transformed into the solid optic nerve by fibers coming from:
- A. The retinal rod and cone cells of the neural retina
  - B. Invading fibers of ectomesenchyme (neural crest)
  - C. Cells of the developing optic placode
  - D. Ganglion cells of the neural retina
  - E. Invading glial cells (Müllers cells)
16. Defects or gaps in the eyelid, iris and even the retina are referred to as:
- ☒ A. Coloboma
  - B. Congenital cataract
  - C. Congenital glaucoma
  - D. Cryptophthalmus
  - E. Congenital aniridia

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21. Which of the following conditions would most likely lead to nerve damage and abnormal physical findings?
- A. Mild rachischisis
  - B. ~~Spinal dermal sinus~~
  - C. Spina bifida with meningocele
  - D. ~~Spina bifida with meningocele~~
  - E. ~~Spina bifida occulta~~
22. Which of the following commissures are not associated with the lamina terminalis?
- A. ~~Habenular~~
  - B. ~~Corpus callosum~~
  - C. Optic chiasma
  - D. Hippocampal
  - E. ~~Anterior~~
23. Which of the following is most likely to be myelinated last in the developing nervous system?
- A. Peripheral spinal nerves
  - B. ~~Spinal cord sensory fibers~~
  - C. Spinal cord motor fibers
  - D. Brain motor fibers
  - E. Brain sensory fibers
24. The nuclei of the hypothalamus are related to the development of the
- A. Basal plates
  - B. Alar plates
  - C. Floor plates
  - D. Roof plates
  - E. Lamina terminalis
25. The lateral gray columns of the spinal cord which are related to the autonomic nervous system take origin from:
- A. Basal plates
  - B. Alar plates
  - C. Roof plates
  - D. Floor plates
  - E. Marginal zone

26. The deep cerebellar nuclei (dentate, globose, emboliform and fastigial) trace their origin to the:

- A. Marginal cerebellar layer
- B. Granular cell layer
- C. Molecular cell layer
- D. Internal germinal layer
- E. External germinal layer

27. The cranial nerve nuclei of the mesencephalon include:

- A. GVE and GSE fibers
- B. Only GVE fibers
- C. Only GSE fibers
- D. GVE, SVE and GSE fibers
- E. Only sensory fibers

28. The pontine and inferior olivary nuclei are said to originate from:

- A. Marginal zone areas
- B. ~~Glioblast cells~~
- C. Neuroblasts in the alar plates
- D. Neuroblasts in the basal plates
- E. The pyramids

29. Which of the following statements is not correct?

- A. Projection fibers of the internal capsule separate the thalamus and hypothalamus as the subthalamic sulcus.
- B. ~~All the cranial ventricles except the aqueduct of Sylvius are associated with a choroid plexus.~~
- C. ~~The corpus striatum is anatomically related to the insula.~~
- D. ~~The hippocampus originates in the archicerebrum of the telencephalon.~~
- E. The so-called choroid fissure is invaginated by vascular pia mater to form a choroid plexus.

30. The most dramatic and damaging manifestation of fetal alcohol syndrome is:

- A. Spina bifida cystica
- B. Arnold-Chiari syndrome
- C. Neurofibromatosis
- D. Holoprosencephaly
- E. Hydrocephaly



31. All of the following are derivatives of the third branchial arch/pouch EXCEPT:

- ~~A. Thymic tissue~~
- ~~B. Parathyroid tissue~~
- C. Thyroid tissue
- D. Portions of the hyoid bone
- E. Stylopharyngeus muscle

32. Rapid enlargement of the branchial arches during the fourth week of development is due primarily to

- A. Proliferation of the cartilaginous component
- B. Inward migration of neural crest cells
- C. Increased mitotic activity in the indigenous mesenchymal component
- D. Infiltration with cells from the occipital myotomes
- E. Production of large amounts of collagen

33. A cervical fistula most commonly has all of the following characteristics EXCEPT:

- A. Has its external opening along the posterior border of sternocleidomastoid muscle.
- B. Has its internal opening in the tonsillar fossa.
- ~~C. It is associated with maldevelopment of branchial arch 2.~~
- ~~D. It is partially lined by cells of ectodermal origin.~~
- ~~E. It is partially lined by cells of endodermal origin.~~

34. A facial cleft extending from the lateral aspect of the nose superiorly toward the medial margin of the orbit could be explained as a lack of fusion of the

- A. Two medial nasal processes.
- B. Lateral and medial nasal processes of the same side.
- C. Lateral nasal processes of the opposite sides.
- ☒ D. Maxillary process and lateral nasal process of the same side.
- E. Maxillary process and medial nasal process of the same side.

35. Structures derived from the first branchial arch include all of the following EXCEPT:

- ~~A. Malleus bone~~
- B. Buccinator muscle
- C. Temporalis muscle
- D. Anterior belly of digastric muscle
- ~~E. Maxillary bone~~

36. The embryonic frontonasal process contribute to all of the following **EXCEPT**:

- A. Borders the stomodeum.
- ~~B. Contributes to the formation of the hard palate.~~
- C. Contributes to the formation of the soft palate.
- ~~D. Borders the incisive foramen as an adult derivative.~~
- ~~E. Contributes both the medial and lateral nasal processes.~~

37. From the lists below, select the one item which least belongs with the others.

- ~~A. Cranial nerve IX~~
- ~~B. Greater cornu of hyoid bone~~
- ~~C. 3rd aortic arch artery~~
- D. Superior pharyngeal constrictor muscle
- ☒ E. Cricoid cartilage

38. From the lists below, select the one item which least belongs with the others.

- A. Tuberculum impar *Tongue*
- ☒ B. Philtrum
- C. Copula *Tongue*
- D. Foramen cecum *Intestine*
- E. Lateral lingual swellings

39. From the lists below, select the one item which least belongs with the others.

- A. Epithelium lining pharyngotympanic (Eustachian) tube
- B. Epithelium on medial surface of tympanic membrane
- C. Epithelium lining palatine tonsillar crypts
- D. Epithelium lining first pharyngeal pouch
- ☒ E. Epithelium lining external auditory canal

40. From the lists below, select the one item which least belongs with the others.

- A. Epiglottis
- B. Cricoid cartilage
- C. Thyroid cartilage
- D. Arytenoid cartilages
- E. Corniculate and cuneiform cartilages

41. The extraembryonic membranes of fraternal (dizygotic) twins would most likely be consist of
- A. separate amniotic and chorionic cavities and membranes for each twin.
  - B. separate amniotic cavities for each twin contained within a common chorionic cavity.
  - C. a common amniotic cavity surrounding both twins contained within a common chorionic cavity.
  - D. none of the above.
42. Lymphocytes in maternal blood and endometrial (decidual) interstitial fluid may come into close contact with the external cell membranes of
- A. the syncytiotrophoblast.
  - B. cytotrophoblastic cells.
  - C. extraembryonic mesodermal cells.
  - D. A and B are correct
  - E. A, B, and C are correct .
43. Amniotic fluid consists of substances and water derived from
- A. the fetal urinary system.
  - B. the fetal respiratory system.
  - C. maternal tissue fluids.
  - D. A and B are correct
  - E. A, B, and C are correct
44. The condition of polyhydramnios is an indication of possible developmental anomalies of the fetal
- A. respiratory system.
  - B. nervous system.
  - C. circulatory system.
  - D. A and B are correct
  - E. A, B, and C are correct
45. Fetal blood cells normally are able to come into contact with the outer cell membranes of
- A. the syncytiotrophoblast.
  - B. cytotrophoblastic cells.
  - C. fetal capillary endothelial cells.
  - D. A and B are correct
  - E. A, B, and C are correct

46. Fetal endoderm normally comes into contact with the fluid within the
- A. chorionic cavity. *Yolk embryonic*
  - ☒ B. yolk sac cavity.
  - C. amniotic cavity.
  - D. A and B are correct
  - E. A, B, and C are correct
47. A triploid embryo with 96 chromosomes and a sex chromosomal component of XXY could result from
- A. lack of release of a polar body after fertilization. *XX*
  - B. fertilization of the secondary oocyte by two spermatozoans.
  - C. nondisjunction of the Y chromosome during the first post-fertilization mitosis.
  - D. A and B are correct
  - E. A, B, and C are correct
48. Critical (sensitive) periods of organ development and maturation occur during the
- A. embryonic period.
  - B. fetal period.
  - C. first several years of postnatal life.
  - D. A and B are correct
  - E. A, B, and C are correct
49. A teratogen that contacts but does not kill the embryo during the second week of development will most likely
- A. produce major defects in the postnatal heart.
  - B. produce major defects in the postnatal spinal cord.
  - C. produce no observable postnatal defects.
  - D. A and B are correct
  - E. A, B, and C are correct*
50. In general, which of the following regions would be the last to complete its major morphological development?
- A. Shoulder
  - B. Hand
  - C. Hip
  - D. Foot
  - E. Perineum

51. An individual with the chromosomal complement of 47, (XXY) will
- A. have a male habitus (body build)
  - B. have a female habitus (body build)
  - ~~C. be very fertile~~
  - D. A and C
  - E. B and C
52. Smoking introduces nicotine and carbon monoxide into the pregnant mothers body. The common results of the presence of these chemicals during pregnancy include
- A. growth retardation of the embryo/fetus
  - ~~B. increased maternal placental circulation~~
  - ~~C. parturition that occurs, on the average, three weeks later than the predicted date.~~
  - D. A and B are correct
  - E. A, B, and C are correct
53. The posterolateral diaphragmatic defect that may lead to herniation of abdominal contents usually results from the failure of fusion between the
- ☒ A. pleuroperitoneal membranes and the septum transversum
  - B. the mesenchyme of the lateral body wall and the septum transversum
  - C. dorsal mesentery of the esophagus and the septum transversum
  - D. A and B are correct
  - E. A, B, and C are correct
54. The mesenchyme of the septum transversum gives rise to
- ~~A. the major portion of the fibrous pericardium~~
  - B. the fibrous portion of the diaphragm
  - ~~C. crura of the diaphragm~~
  - D. A and B are correct
  - E. A, B, and C are correct
55. The primitive pleural cavities (pericardioperitoneal canals)
- ☒ A. are situated lateral to the developing foregut
  - B. are situated ventrolateral to the developing heart
  - ~~C. are lined with epithelium of endodermal origin~~
  - D. A and B are correct
  - E. A, B, and C are correct

Match up the letters with the correct statement. The letters maybe used more than once.

Questions 60 to 66

- A. Gametogenesis in human female
- B. Gametogenesis in human male
- C. Both A and B are correct
- D. Neither A nor B is correct

- 60. Meiosis is initiated prior to birth of the individual **A**
- 61. Cells at end of <sup>2nd</sup> first meiotic division should demonstrate identical karyotypes **C**
- 62. Produces cells that contain DNA precursors necessary for replication of chromosomes of zygotes first mitotic division **A**
- 63. Produces cell that determines genetic sex of zygote **B**
- 64. Produces cells that normally may live three days or more after release from the gonad **C**
- 65. Produces cell that may develop into zygote by means of parthenogenesis **D**
- 66. Cell released from gonad can be described as being  $2N, 2C$  **D**

Questions 67 to 71

- A. Embryonic epiblast
- B. Embryonic hypoblast
- C. Both A and B are correct
- D. Neither A nor B is correct

- 67. Gives rise to the chorion **D**
- 68. Gives rise to intraembryonic endoderm **C**
- 69. Gives rise to intraembryonic mesoderm **A**
- 70. Gives rise to the tissue included in the prochordal plate and oropharyngeal membrane **C**
- 71. Gives rise to the syncytiotrophoblast **D**

**Questions 72 to 78**

2 weeks from LMP  
3 weeks pregnant  
5 weeks

A twenty year-old female patient is making a one-week return visit to the medical clinic because of unexplained nausea of three weeks duration and more recent abdominal discomfort. She had been seen one week earlier. In her medical history she states that she has been sexually active. She also states that, although she has a very regular ovarian/uterine cycle of 28 days, the flow related to the menstrual periods has been variable. She is currently six days past her last menstrual period which lasted three days. Samples of blood and urine were obtained for laboratory examination on both clinic visits.

72. Assuming that she is not pregnant, the level of progesterone in her current blood samples should be \_\_\_ than that of the previous visit.
- A. higher  
B. lower  
C. unchanged
73. Assuming that she is pregnant, the level of progesterone in her current blood samples should be \_\_\_ than that of her previous visit.
- A. higher  
B. lower  
C. unchanged
74. Assuming that she is pregnant, the level of chorionic gonadotropin would be \_\_\_ than that of her previous visit.
- A. higher  
B. lower  
C. unchanged
75. Assuming that she is pregnant, the conceptus could be in its \_\_\_ week of development.
- A. 2nd  
B. 4th  
C. 6th  
D. 8th  
E. None of the above

76. Assuming that she is pregnant, the conceptus would be
- A. beginning the process of implantation.
  - B. beginning to develop its heart and vascular system.
  - C. completing its embryonic development.
  - D. A and B
77. Ultrasonographic examination indicates that her uterus does not have a conceptus in it. You can reasonably assume that she is not pregnant.
- A. True
  - B. False
78. Further procedures that, if conducted in the hospital the next day, may reasonably clarify the condition of the possible conceptus would include
- A. amniocentesis
  - B. cordocentesis
  - C. fetoscopy
  - D. all of the above procedures/tests
  - E. none of the above procedures/tests

**Questions 79 to 83**

- A. Cytotrophoblast
  - B. Syncytiotrophoblast
  - C. Both A and B are correct
  - D. Neither A nor B is correct
79. Synthesizes and releases progesterone *D*
80. May come into direct contact with maternal blood *C*
81. May come into contact with blood of embryo/fetus *A*
82. Possesses identical genome as embryo/fetus *C*
83. The independent portion of the conceptus *D*



**Questions 84 to 91**

Indicate the germ layer of origin for each of the following tissues or structures

- A. Ectoderm
- B. Mesoderm
- C. Endoderm
- D. A and B
- E. B and C

- 84. Neural crest *A*
- 85. Epidermis of skin *A*
- 86. Complete wall of yolk sac *E*
- 87. Lateral body wall *D*
- 88. Lens of eye *A*
- 89. Neural plate *A*
- 90. Majority of skeletal muscle tissue *B*
- 91. Blood cells *E*

**Questions 92 to 95**

- A. Decidua basalis
- B. Decidua parietalis
- C. Decidua capsularis
- D. A and B
- E. None of the above

- 92. A portion of the conceptus *E*
- 93. A portion of the afterbirth *A*
- 94. A portion of the placenta *A*
- 95. Contains maternal blood vessels supplying placenta *A*

96. Postpartum hemorrhage is usually prevented by
- A. the collapse and retraction of the broken endometrial vessels.
  - B. factors released by the placenta that enhance blood coagulation.
  - C. strong, continuing contractions of muscles of uterine wall
  - D. A and B are correct
  - E. A, B, and C are correct
97. The usual length of time between fertilization and parturition is
- A. 36 weeks.
  - B. 38 weeks.
  - C. 40 weeks.
  - D. 42 weeks.
98. The earliest that a new individual is usually capable of independent life is after
- A. 18 - 20 weeks of gestation
  - B. 23 - 27 weeks of gestation
  - C. 30 - 32 weeks of gestation
  - D. 36 - 38 weeks of gestation
  - E. graduation from medical school
99. With reference to homeotic genes, all but one of the following is true.
- A. Control regional specificity of development.
  - B. Contain a homeobox of about 183 base pairs.
  - C. Its base pairs encode a transcriptional factor that interacts directly with DNA.
  - D. Paired PAX genes are one family of homeobox genes and cannot be classified as segmentation genes.
  - E. May be activated by fibroblast growth factor and transforming growth factor- $\beta$  (TGF- $\beta$ ).
100. The special visceral efferent (SVE) group of nuclei associated with innervation of the muscles of the first and second branchial arches are associated with the
- A. Telencephalon
  - B. Diencephalon
  - C. Mesencephalon
  - D. Metencephalon
  - E. Myelencephalon